CLAIMS

WHAT IS CLAIMED IS:

1. A cam system comprising:

at least two cam structures, the at least two cam structures being adapted to co-operate with a cam follower capable of following a preferred profile effected by the configuration of at least one of the at least two cam structures and a movable cam shaft, the at least two cam structures including:

at least one central cam structure and at least one side cam structure, the at least one central cam structure being adapted to receive the movable cam shaft and operate therewith, the at least one central cam structure further adapted to receive the at least one side cam structure, the at least one side cam structure being adapted to be variably positioned with respect to the at least one central cam structure thereby effecting a change in the profile of the at least one central cam structure alone and in turn effecting a change in the overall profile followed by the cam follower during movement of the cam shaft and the at least two cam structure(s) associated therewith;

wherein the change in profile effected by the positional configuration of the at least one side cam structure relative to the at least one central cam structure enabling variation in the translational motion to the cam follower during movement of the movable cam shaft and the at least two cam structures being movable therewith and effecting in turn a variation in either or both speed and power of operation of a preferred movement relevant to a mechanical requirement.

2. A cam system as claimed in Claim 1 wherein the cam structure(s) comprises any one of a plate cam, a face cam, a drum cam relevant to the application with which the cam system is used.

3. A cam system as claimed in Claim 1 wherein the follower comprises any one of a knife-edge follower, a roller follower.

4. A cam system as claimed in Claim 1 wherein either or both the central cam structure and the side cam structure take any appropriate shape as required to effect a preferred edge profile as required to effect preferred translational motion via the follower resulting in the preferred operation of the mechanical requirement.

5. A cam system as claimed in Claim 1 wherein the number and arrangement of the side cam structure(s) relative to the central cam structure(s) determine desired variability in either or both the timing and the speed of the translational motion of the follower to effect the mechanical operation required.

6. A cam system as claimed in Claim 5 wherein either or both the central cam structure(s) and the side cam structure(s) are maintained in a fixed relationship to each other during operation of the cam system by either or both cam pivoting apparatus and cam locking apparatus.

7. A cam system as claimed in Claim 6 wherein to maintain the cam structures in a fixed relationship to each other, each structure includes at least one aperture capable of alignment with a complementary aperture on another structure, through which the cam locking apparatus is engaged.

8. A cam system as claimed in Claim 7 wherein the cam locking apparatus is adapted to complement the configuration of the apertures and includes any one or more of a tapered, threaded, bayonet, push fit locking pin.

9. A cam system as claimed in Claim 6 wherein prior to effecting the cam structures in a fixed relationship to each other, the side cam structure is adjustable positionally with respect to the central cam structure to effect a range of central cam: side cam configuration options.

10. A cam system as claimed in Claim 9 wherein the range of configuration options is achievable via the use of complementarily positioned apertures on each cam structure, the positioning of the apertures on each cam structure and the distances between adjacent apertures.

11. A cam system as claimed in Claim 10 wherein variable positioning of the position of either or both the central and side cam structures relative to each other in turn effects variation in the profile of the combined cam structure.

12. A cam system as claimed in Claim 11 wherein the variation in the profile of the combined cam structure in turn varies the translational movement of a cam follower in contact therewith and effects a variation in the speed or power of operation of the associated mechanical function required.

13. A cam system as claimed in Claim 11 wherein the side cam structure(s) and/or the central cam structure(s) are adapted to be variably positioned by use of at least one cam pivoting apparatus.

14. A cam system as claimed in Claim 13 wherein the cam pivoting apparatus when in place enables the side cam structure(s) to freely pivot relative to the central cam structure(s) to whatever position is required to effect the preferred combined edge profile and the cam structures are maintained in that configuration via the cam locking apparatus.

15. A cam system as claimed in Claim 14 wherein where multiple central cam structures are employable, the central cam structures are arranged substantially parallel to, but distanced from each other.

16. A cam system as claimed in Claim 15 wherein the distance between the central cam structures is adapted for attachment of at least one side cam structure.

17. A cam system as claimed in Claim 16 wherein the side cam structure(s) are arranged relative to the central cam structure(s) as a substantially seamless extension to the edge profile of the overall combined structure.

18. A cam system as claimed in Claim 16 wherein the side cam structure(s) includes a stepped configuration in cross-section adapted to overlap a portion of a surface of a central cam structure but of a depth such that the combined edge profile is substantially seamless yet the combined edge profile is different to the edge profile of the central or side cam structure alone.

19. A cam system as claimed in Claim 14 wherein the cam locking apparatus is a tapered locking pin.

20. A cam system as claimed in Claim 19 wherein the taper of the locking pin is set at 7° (degrees).

21. A cam system as claimed in Claim 20 wherein the tapered locking pin engages with apertures on the cam structures which are also tapered to 7° (degrees) to accept the pin.

22. A cam system as claimed in Claim 21 wherein in the locking pin includes a threaded portion at its outer distal end adapted to engage with complementarily configured threaded bolt.

23. A cam system as claimed in Claim 14 wherein the cam structures include apertures located at predetermined distances which are adjustment apertures to variably position the side cam structures with respect to the central cam structure(s) through a range of interconnected configuration options.

24. A cam system as claimed in Claim 13 wherein the cam pivoting apparatus is a cam pivot pin.

25. A cam system as claimed in Claim 24 wherein at least one cam pivot pin is provided for each additional side cam structure interconnected with one or more central cam structures.

26. A cam system as claimed in Claim 25 wherein a cam pivot pin is retained in position via use of locking system, including a cotter pin through an aperture at the base of the pivot pin.

27. A cam system as claimed in Claim 12 wherein the operational speed variations available when the cam system is set at its highest setting with two side cam structures attached (to form its largest configuration) compared with its lowest setting (smallest configuration), is approximately 200% (two hundred percent).

28. A cam system as claimed in Claim 23 wherein adjustment apertures in each of two side cam structures number six, each aperture setting adjustment in relation to the side cam structures effects a comparable incremental increase in the speed generation resulting from the translational motion of the cam follower by 16.6%.

29. A cam system as claimed in Claim 28 wherein the incremental speed effect is relevant for equally spaced holes in the central cam structure(s).

30. A cam system as claimed in Claim 1 wherein the cam structure is associated with a traveling irrigator.

31. A cam system as claimed in Claim 30 wherein the cam structure(s) having a preferred profile in operation effects preferred translational motion via the cam follower to wind in the wire rope of the travelling irrigator at a preferred speed, thereby effecting movement of the irrigator across a surface at a preferred speed.

32. A traveling irrigator incorporating a cam system as claimed in Claim 1.

33. A method of manufacturing a cam system, the cam system comprising at least two cam structures, the at least two cam structures being adapted to co-operate with a cam follower capable of following a preferred profile effected by the configuration of at least one of the at least two cam structures and a movable cam shaft, the at least two cam structures comprising at least one central cam structure and at least one side cam

structure, the at least one central cam structure being adapted to receive the movable cam shaft and operate therewith, the at least one central cam structure further adapted to receive the at least one side cam structure, the at least one side cam structure being adapted to be variably positioned with respect to the at least one central cam structure thereby effecting a change in the profile of the at least one central cam structure alone and in turn effecting a change in the overall profile followed by the cam follower during movement of the cam shaft and the at least two cam structure(s) associated therewith, wherein the change in profile effected by the positional configuration of the at least one side cam structure relative to the at least one central cam structure enabling variation in the translational motion to the cam follower during movement of the movable cam shaft and the at least two cam structures being movable therewith and effecting in turn a variation in either or both speed and power of operation of a preferred movement relevant to a mechanical requirement, the method including the steps of:

a) manufacturing at least one central cam structure and at least one side cam structure each having a preferred profile for use separately or combined;

b) providing, in the central cam structure, an aperture adapted to receive a movable cam shaft;

c) providing the central cam structure(s) and the side cam structure(s) with adjustment apertures enabling repositioning of the side cam structure(s) relative to the central cam structure(s);

d) manufacturing pivoting apparatus to engage with the cam structures to enable the cam structures to pivot relative to each other;

e) manufacturing locking apparatus to maintain the cam structures in a preferred fixed relationship having a substantially seamless yet combined edge profile different to the edge profile of the central or side cam structure alone; and

f) providing the edge/face profile of the cam structures singularly or combined being adapted to co-operate with a cam follower.

34. A method of varying the speed of operation of a cam system, the cam system comprising at least two cam structures, the at least two cam structures being adapted to co-operate with a cam follower capable of following a preferred profile effected by the configuration of at least one of the at least two cam structures and a movable cam shaft, the at least two cam structures comprising at least one central cam structure and at least one side cam structure, the cam structures including adjustment apertures located at predetermined distances which in conjunction with pivoting apparatus variably positions the side cam structures with respect to the central cam structure(s) through a range of interconnected configuration options, and locking apertures which in conjunction with locking apparatus maintains the cam structures in a preferred interconnected configuration, the central cam structure being adapted to receive the cam shaft and move therewith, the central cam structure further adapted to receive the at least one side cam structure, the side cam structure being adapted to be positionally varied with respect to the central cam structure via the pivoting apparatus thereby effecting a change in the profile of the central cam structure alone, and in turn effecting a change in the overall profile followed by the cam follower during movement of the cam shaft and the cam structure(s) related thereto, wherein the change in profile effected by

the positional configuration of the side cam structure effecting variable translational motion to the cam follower during movement of the cam shaft and cam structures associated therewith and effecting in turn a variation in either or both power and speed of operation of a preferred a mechanical requirement, the method including the steps of:

a) pivoting, via the pivoting apparatus, the side cam structure(s) relative to the central cam structure(s) between smallest and greatest profile configuration options to achieve the preferred profile configuration relevant to the preferred speed and/or power of operation required;

b) aligning adjustment apertures of the side cam structure(s) with the adjustment apertures of the central cam structure; and

c) inserting cam locking apparatus through aligned cam locking apertures to effect a fixed substantially seamless yet combined edge profile different to the edge profile of the central or side cam structure alone.

35. An existing cam system capable of being modified to effect a cam system as claimed in Claim 1.

36. An adjustable cam system as claimed in Claim 1 for use with a traveling irrigator.

37. A cam side structure for use with a cam system as claimed in Claim 1.

38. A cam central structure for use with a cam system as claimed in Claim 1.